

BROWNWATER LEVEE FOREST (MEDIUM LEVEE SUBTYPE)

Concept: Brownwater Levee Forests are forest communities of natural levee deposits along brownwater Coastal Plain rivers, with a significant component of the suite of levee tree species. The Medium Levee Subtype covers levees of medium height, typically in the middle Coastal Plain stretches of rivers and sometimes on lower parts of high upstream levees. The rich-site species and marginal wetland species of the High Levee Subtype are minor or absent, plant species richness is generally lower, and more water-tolerant species are usually present in small numbers. Also included is one example dominated by a disjunct population of *Populus deltoides*, with an admixture of other levee species.

Distinguishing Features: Brownwater Levee Forests usually are easily distinguished by their location adjacent to Coastal Plain Brownwater Rivers. Levee Forests are distinguished from Bottomland Hardwoods communities by having a significant component of the suite of levee species that includes *Fraxinus pennsylvanica*, *Celtis laevigata*, *Platanus occidentalis*, *Betula nigra*, *Acer negundo*, and *Ulmus americana* in natural condition. The Medium Levee Subtype is distinguished from the High Levee Subtype by the absence of characteristic species of rich sites shared with Piedmont levees, such as *Aesculus sylvatica*, *Lindera benzoin*, *Laportea canadensis*, *Nemophila aphylla* (= *Nemophila microcalyx*), and *Corydalis flavula*. Species of wetter sites, such as *Carya aquatica*, *Nyssa aquatica*, *Quercus lyrata*, and *Taxodium distichum*, may be present but only in small numbers or in wetter microsites.

Synonyms: *Fraxinus pennsylvanica* - *Ulmus americana* / *Carpinus caroliniana* / *Boehmeria cylindrica* Forest (CEGL007806).

Ecological Systems: Atlantic Coastal Plain Small Brownwater River Floodplain Forest (CES203.250). Southern Atlantic Coastal Plain Large River Floodplain Forest (CES203.066).

Sites: The Medium Levee Subtype occurs along channels and on point bar deposits of brownwater rivers. It may occasionally occur on recently abandoned channel segments farther from the active river. The Medium Levee Subtype most often borders rivers in the middle Coastal Plain but may occur in the inner Coastal Plain where broad levees slope away from the river.

Soils: Soils are coarse-textured alluvial soils, with little horizon development because of relatively recent deposition. Most levees are mapped as Chewacla (Fluvaquentic Dystrudept) or Congaree (Oxaquic Udifluent). A few are mapped as Chastain or Wehadkee (Fluvaquentic Endoaquepts).

Hydrology: The Medium Levee Subtype is intermittently or seasonally flooded, generally only for short periods but longer than in the High Levee Subtype. Soils are well drained when not flooded but are closer to the water table than in the High Levee Subtype. These levee areas have substantial microrelief, which leads to variation in hydroperiod, though only very limited areas are very wet. Brownwater rivers, in contrast to blackwater, tend to have periods of sustained high flow, usually in winter and spring, where not controlled by dams. However, floods seldom remain deep enough to submerge levees for long periods.

Vegetation: Brownwater Levee Forests are naturally closed forests punctuated by canopy gaps. In the Medium Levee Subtype, the canopy is a varying mix that has *Fraxinus pennsylvanica*,

Ulmus americana, and *Liquidambar styraciflua* as the most frequent dominant species. Plot data (Rice and Peet 2001, Faestel 2012, CVS data) show *Platanus occidentalis*, *Celtis laevigata*, *Quercus laurifolia*, and *Acer rubrum* var. *trilobum* also frequent and sometimes dominant, and these data show *Carya aquatica*, *Carya cordiformis*, *Populus heterophylla*, *Acer saccharinum*, *Ulmus alata*, *Diospyros virginiana*, and *Taxodium distichum* as fairly frequent at least on some rivers. The dominant understory species most frequently include *Carpinus caroliniana*, *Acer negundo*, and less frequently *Ilex opaca*, *Crataegus viridis*, and *Fraxinus caroliniana*, in addition to various canopy species. *Ilex decidua* is most often the dominant shrub. *Arundinaria tecta* may be fairly frequent but is less abundant than in the High Levee Subtype. Woody vines are also prominent. *Smilax rotundifolia*, *Toxicodendron radicans*, *Campsis radicans*, *Parthenocissus quinquefolia*, *Berchemia scandens*, *Smilax bona-nox*, *Muscadinia rotundifolia*, *Bignonia capreolata*, and *Nekemias arborea* all occur with high frequency and sometimes high cover in plot data. *Thyrsanthella difformis*, *Smilax hispida*, *Vitis aestivalis*, and other *Vitis* species also may be fairly frequent. The herb layer is generally dense and fairly diverse. Species at high to moderate frequency, at least on some rivers, include *Commelina virginica*, *Saururus cernuus*, *Carex louisianica*, *Lobelia inflata*, *Viola sororia*, *Mitchella repens*, *Leersia oryzoides*, *Leersia virginica*, *Solidago caesia*, *Persicaria punctata*, *Persicaria hydropiperoides*, *Onoclea sensibilis*, *Carex grayi*, *Carex typhina*, and a number of other *Carex* species. Species shared with the Piedmont and species shared with rich mesic sites are notably less numerous and less abundant than in the High Levee Subtype, while species of wetter sites are more abundant. Exotic plants, especially *Lonicera japonica* and *Microstegium vimineum*, may be abundant. The epiphyte *Tillandsia usneoides* may have high cover, and *Pleopeltis michauxiana* may cover trunks and branches of some trees.

Range and Abundance: Ranked G4? In North Carolina, the Medium Levee Subtype is locally abundant along the middle Coastal Plain reaches of the several brownwater rivers. It is sometimes present in the upper reaches, where it occurs on the lower edges of high levees. Narrow strips of Brownwater Levee Forest often are left where the rest of the floodplain has been logged. The equivalent NVC association ranges from North Carolina to Alabama.

Associations and Patterns: The Medium Levee Subtype occurs as linear bands along most of the frontage of brownwater rivers in the middle Coastal Plain. In the inner Coastal Plain, it may occur on the lower slope of wide levees away from the river and occasionally along sloughs away from the river. Most examples grade to Cypress–Gum Swamp or Brownwater Bottomland Hardwoods, and they may be bordered by Sand and Mud Bar along the river.

Variation: No variants are recognized. Some differences among different rivers can be seen in existing data and warrant further investigation. *Acer saccharinum* is widespread on the Roanoke River and not present on other rivers. A local area with a disjunct population of *Populus deltoides* occurs only on the Roanoke River. Other differences visible in plot data, such as occurrence of frequent *Quercus laurifolia* only on the Roanoke River, are more likely to be accidents of plot placement.

Dynamics: Dynamics of the Medium Levee Subtype are similar to the High Levee Subtype. Flooding is of somewhat longer duration and frequency but still tends to be brief.

Comments: *Populus deltoides* - *Salix caroliniana* Forest (CEGL007343) may have been attributed to North Carolina, but it seems best to treat the forest with disjunct *Populus deltoides* as part of this subtype, since it occurs in a very similar site and is also floristically very similar.

Rare species:

Vascular plants: *Cardamine douglassii*, *Carya laciniosa*, and *Urtica chamaedryoides*.

References:

Faestal, M. 2012. Classification and description of alluvial plant communities of the North Carolina Coastal Plain. M.S. thesis, University of North Carolina-Chapel Hill.

Rice, S.K., R.K. Peet, and P. Townsend. 2001. Gradient analysis and classification of the forests of the lower Roanoke River floodplain, North Carolina: a landscape perspective. Unpublished manuscript.